

PATENT  
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: JESSE J. WILLIAMS AND ERIC J. HANSEN

For: EXTRACTION CLEANING WITH OXIDIZING AGENT

Serial No.: 09/589,973

Examiner: Derrick G. Hamlin

Filed: 06/08/00

Art Unit: 1744

Docket: 71189-1300

#7  
MMT  
530-02

## DECLARATION UNDER 37 C.F.R. § 1.131 OF JESSE J. WILLIAMS

Commissioner for Patents  
Washington, DC 20231

Sir:

Jesse J. Williams hereby declares that:

1. I am a citizen of the United States and a resident of Zeeland, Michigan. I am an inventor named in the above-identified U.S. patent application.
2. Since at least April 1993, I have been employed as Manager of Chemical Development at BISSELL Homecare, Inc., the assignee of the above-identified patent application, and its predecessor in interest, BISSELL Inc. (hereinafter collectively referred to as BISSELL).
3. Prior to September 3, 1997, Eric Hansen and I conceived of the invention of admixing an oxidizing agent with a cleaning solution in an extraction cleaning machine of the type manufactured and sold by BISSELL in the manner disclosed and claimed in the above-identified patent application.
4. Prior to September 3, 1997, the invention set forth in at least claim 1 of the above-identified patent application was actually reduced to practice by adding a TAED/sodium perborate mixture to a cleaning solution (BISSELL Carpet Care) in an extraction cleaning machine identified as a Big Green Cleaning Machine. Before September 3, 1997, standard tests were performed to compare the cleanability of BISSELL Carpet Care cleaning solution with and without TAED/sodium perborate. The report of the standard test showed to my satisfaction that

the addition of a TAED/sodium perborate mixture to a BISSELL Carpet Care cleaning solution in an extraction cleaning machine significantly improved the cleanability of the BISSELL extraction cleaning machine.

5. Attached hereto as Exhibit A is a BISSELL Product Testing Laboratory report setting forth the testing that was conducted under our supervision and direction. Although the date of the report is before September 3, 1997, these dates have been redacted. The report, Exhibit A, shows that the addition of a mixture of TAED/sodium perborate to a cleaning solution in a process for cleaning carpet wherein the cleaning solution and TAED/sodium perborate is sprayed onto a carpet and then removed by suction enhances the carpet cleaning process compared with the use of the carpet cleaning solution alone.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Dated: 5/24/02

By Jesse J. Williams  
Jesse J. Williams

G0068112

MAY-24-2002 16:46

Garry Bair LLP

616 742 1010 P.11/22

## **EXHIBIT A**

BISSELL R &amp; D

VARNUM

002



M E M O

Homecare Division

P.O. Box 1888

Grand Rapids, MI 49501-7888, USA

2345 Walker N.W.

Grand Rapids, MI 49504-2345, USA

Telephone: (616) 453-4451

Fax: (616) 453-1383

DATE: [REDACTED]

TO: Gary Kasper, Laura Prominski, Diane Simek

CC: Dave McDowell

FROM: Eric J. Hansen

SUBJECT: Results of TAED/Sodium Perborate "All Fabric Bleach" for Deep Cleaning

The European "all fabric bleach" laundry chemistry using TAED (tetra acetyl ethylene diamine) and a persalt (peroxide carrier), in this case sodium perborate, was tried as an additive package to BISSELL Carpet Care. Standard lab cleanability tests were run at 70, 120, and 160 degrees Fahrenheit.

The summary results are attached. The key findings included the following:

- 1) TAED/Sodium Perborate cleaned better than Carpet Care alone at all three temperatures. The cleaning differences were statistically significant at the 95% or greater confidence level in each case.
- 2) The largest increase in cleaning efficacy was at 70 degrees F. This would indicate oxygenated "all fabric bleaches" might be useful for all BISSELL machines - not just "heated water" machines.
- 3) The obvious effectiveness of this "all fabric bleach" begs the question of whether it could be a BISSELL stand alone chemical product in the form of a "stain stick" or liquid to work with our line of Chemicals and Deep Cleaners.

We should discuss if further testing/development is desired and what direction it should take.

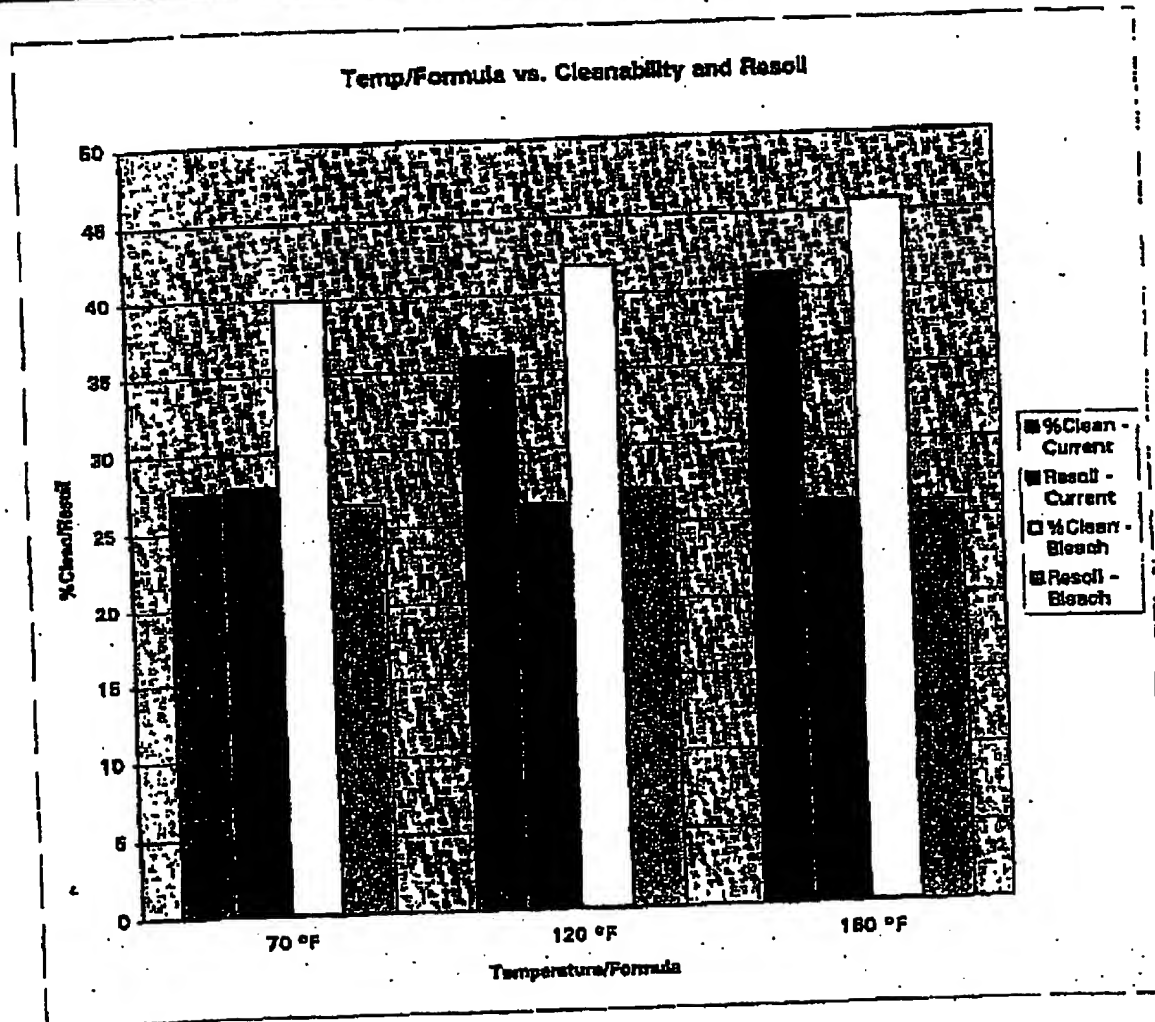
# REDACTED

BISSELL R. &amp; D

VARNUM

003

Tank Temp	%Clean - Current	Resoil - Current	%Clean - Bleach	Resoil - Bleach
70 °F	27.48	27.88	39.97	28.55
120 °F	35.99	26.35	41.9	27.18
180 °F	41.09	26.11	45.7	26.95

**REDACTED**

4437-42.XLS-Clean, Resoil vs temp

BISSELL R &amp; D

VARNUM

004

**BISSELL INC. - HOMECARE DIVISION**  
**PRODUCT TESTING LABORATORY REPORT**

PROJECT #: 970077

TO: Eric Hansen

FROM: Barb Reed

DATE: [REDACTED]

\* **Note** - Claims based upon the information and data contained in this report cannot be made unless first reviewed with the Bissell Homecare Engineering Department.

**OBJECTIVE:**

Determine if all-fabric bleaching chemistry increases cleaning of Bissell machine/chemical at various temperatures.

**CONCLUSION:**

The addition of TAED/Sodium Perborate to the cleaning solution enhances the cleaning effect of the current Bissell Carpet Care. This effect is more pronounced at lower temperatures. Resoil properties do not seem to be adversely affected. Additional testing would be required to determine the optimum ratio of TAED/Sodium Perborate to use. There was more foam generated in both the clean water and recovery tanks with the addition of the bleaching chemicals. See data section for complete results.

**EQUIPMENT:**

1. X-rite 948 Spectrocolorimeter with computer and "Colorstart" software
2. Mettler Scale
3. 12" by 27" medium pile white nylon carpet
4. Big Green Clean Machine with regular extract wand
5. Current Bissell Carpet Care (from factory)
6. TAED chemical
7. Sodium Perborate chemical
8. Standard dirt prepared in Bissell Test Lab
9. Ball mill and 100 ceramic balls

**REDACTED**

BISSELL R &amp; D

VARNUM

005

**PROCEDURE:**

Carpets were cleaned with a Big Green Clean Machine and resoiled according to Bissell BDT-101 and BDT-102. Four carpets were cleaned in each set. Water temperature was taken before and after cleaning each set. Temperatures were recorded for clean water in bucket and at the tip of the spray wand. For carpets cleaned with the bleaching chemicals 5 oz of Carpet Care, 20 grams of Sodium Perborate and then 20 grams of TAED were added to each gallon of water. Carpets were cleaned with 4 wet strokes followed by 2 dry strokes. Foam generated in both the clean water and recovery tanks was noted for each set of carpets.

**DATA:**

A summary of the cleanability data is shown in the table below. Detailed data sheets are in the raw data section.

Formula	Temperature	% Pickup	% Clean	$\Delta E(vi-r)$	$\Delta E(va-r)$
Current	160°F	95.5	41.09	26.11	4.62
Bleaching	160°F	94.9	45.70	25.95	4.02
Current	120°F	96.2	35.99	26.35	4.19
Bleaching	120°F	95.3	41.90	27.18	3.82
Current	70°F	96.9	27.48	27.86	4.70
Bleaching	70°F	95.7	39.97	26.55	4.20

A lower  $\Delta E$  shows better cleaning. Differences of less than 2 cannot be detected by the untrained eye. The  $\Delta E(vi-r)$  compares the virgin and revacuumed values and the  $\Delta E(va-r)$  compares the vacuumed and revacuumed values.

The attached chart shows a comparison of the temperature vs cleanability and resoil for current Carpet Care and Carpet Care with bleaching chemicals added. Significant statistical differences in cleanability are seen at all temperatures tested with the addition of the bleaching chemicals. This is most notable at room temperature. The resoil properties do not appear to change that drastically with the addition of the bleaching chemicals.

Addition of the bleaching chemicals to the solution resulted in significant foam generation in the clean water tank. This was more pronounced at the higher temperatures. Foam generated in the recovery tank also increased slightly over plain Carpet Care. This was most noticeable at 70°F.

These tests were performed between [REDACTED] and [REDACTED]

REPORTED BY Barb Reed

**REDACTED**

BISSELL R &amp; D

VARNUM

008

LABORATORY APPROVAL *Eric Williams*

LABORATORY DISPOSITION: As tested, addition of oxygenated bleaching agents to Bissell carpet cleaning solution showed statistically significant differences versus Bissell carpet cleaning solution without any additives.

## ENGINEERING APPROVAL \_\_\_\_\_

ENGINEERING DISPOSITION: Initial "all fiber bleach" additive results were positive for enhanced cleaning. The level and ratio of TAED/Sodium Percarbonate require further development if their addition to the formulation is desired.

REVIEWED BY *Eric Williams*

REVIEWED BY \_\_\_\_\_

**REDACTED**



BISSELL R &amp; D

VARNUM

007

## TEST LAB WORK REQUEST

TEST#: 970077

PRIORITY: \_\_\_\_\_

TEST CATEGORY: ☐ EVALUATION ☒ DEVELOPMENT ☐ CLAIM SUBSTANTIATION ☐ APPROVAL

REQUEST DATE: \_\_\_\_\_

DESIRED COMPLETION DATE: \_\_\_\_\_

REQUESTOR: EJH

DEVELOPMENT ENGINEER: \_\_\_\_\_

EJH

REQUESTOR'S DEPARTMENT: \_\_\_\_\_

☒ DEEP CLEANING/CHEMICALS  
☐ EPBU☐ QUALITY☐ VACUUM/SWEEPER  
☐ MANUFACTURING

PROJECT #/ DESCRIPTION: \_\_\_\_\_

#960 Test cleaning effectiveness of TAED/Sodium Perborate added to Carpet Care solution at various cleaning temperatures.

PRODUCT MODEL #: 923 Upright PowerSteamerSAMPLE SIZE: 4 Carpets per variableCOMPONENT DESCRIPTION: NACOMPONENT MANUFACTURER / PART #: NAOBJECTIVE: Determine if all fabric bleaching chemistry increases cleaning of BISSELL machine/chemicalREASON FOR TESTING: Create sales/marketing advantage for 960 and other BISSELL products

SEQUENCE NUMBER	TEST NUMBER	DESCRIPTION	QTY TO TEST	DATE NEEDED	WITNESS TESTING?
	BDT101	Clean carpet w/ 923 Upright steamer - use Carpet Care at 5oz/gallon			
		Clean 4 carpets per variable.			
		Clean using 1) 70 degree F Carpet Care solution			
		2) 120 degree F " " "			
		3) 160 degree F " " "			
		4) 70 degree F Carpet Care solution W/ TAED Bleach			
		5) 120 degree F " " "			
		6) 160 degree F " " "			
		Mix TAED / Sodium Perborate at a 1:1 weight ratio. Mix thoroughly into Carpet Care solution before cleaning carpets. Use 40 Grams total powder mix per gallon of solution.			

DISPOSAL INSTRUCTIONS: ☒ RETURN TO REQUESTOR ☐ SCRAP ☐ OTHER \_\_\_\_\_LAB APPROVAL: DW

PROMISED COMPLETION DATE: \_\_\_\_\_

ACTUAL COMPLETION DATE: \_\_\_\_\_

LAB TECHNICIAN(S): B. REED

REDACTED

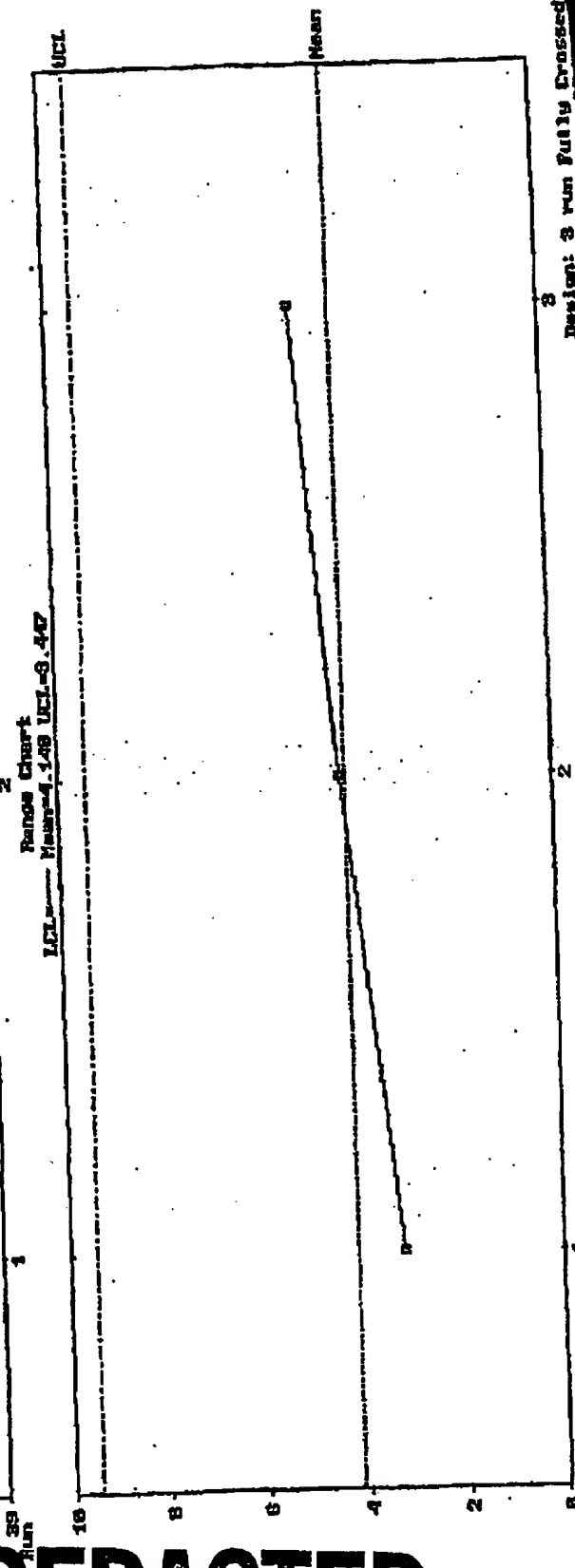
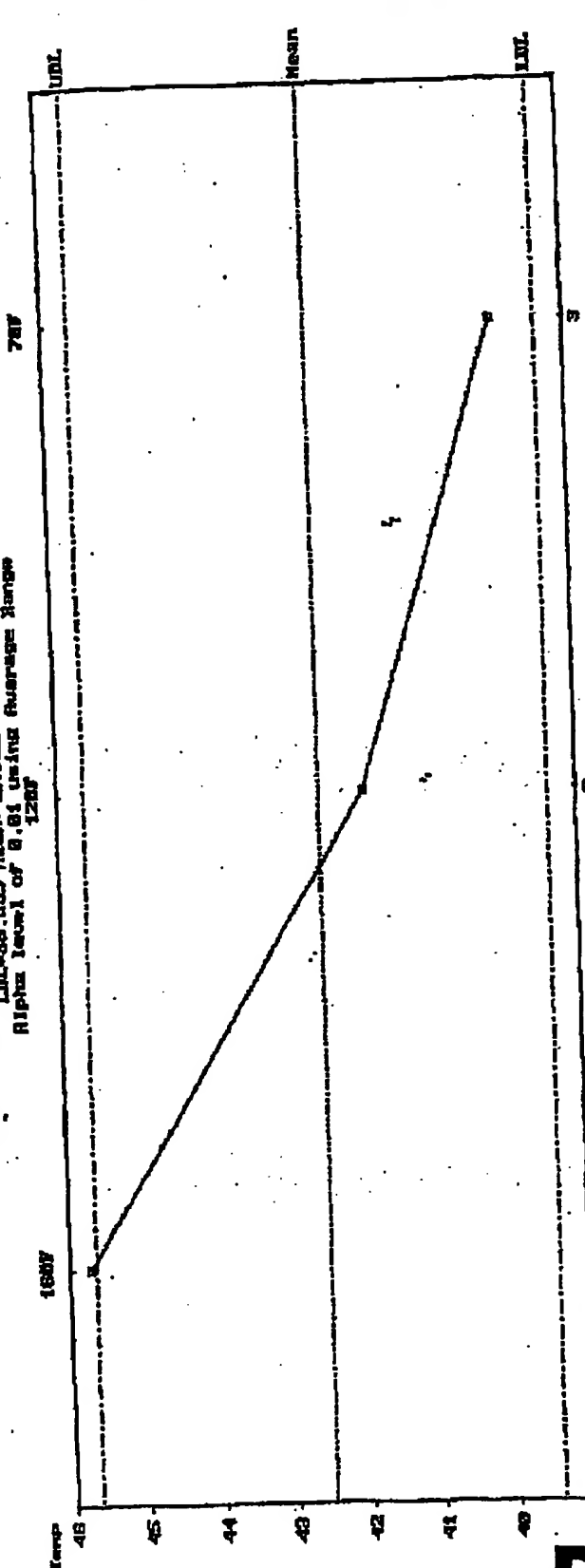
KAPATHI@BISSELL.COM

BISSELL R & D

VARNUM

008

One Day Run for N Clean  
Est. 80X-Bar=8.978 H=9.282 for 3 subgroups with 8.4 df  
LWL=88.385 Mean=42.622 UWL=45.548  
Alpha level of 0.01 using Average Range



Design: 3 run Fully Crossed

Run  
Problem File: bleach1  
Study Name: Temp effect, Bleach

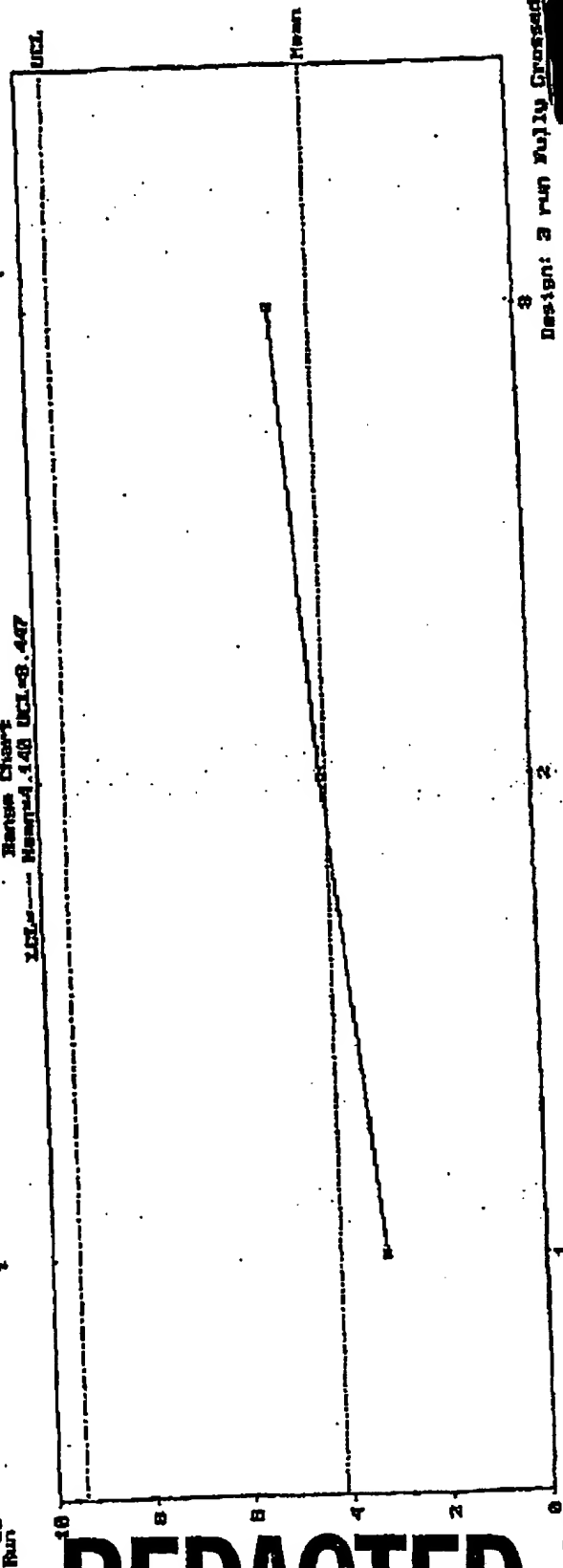
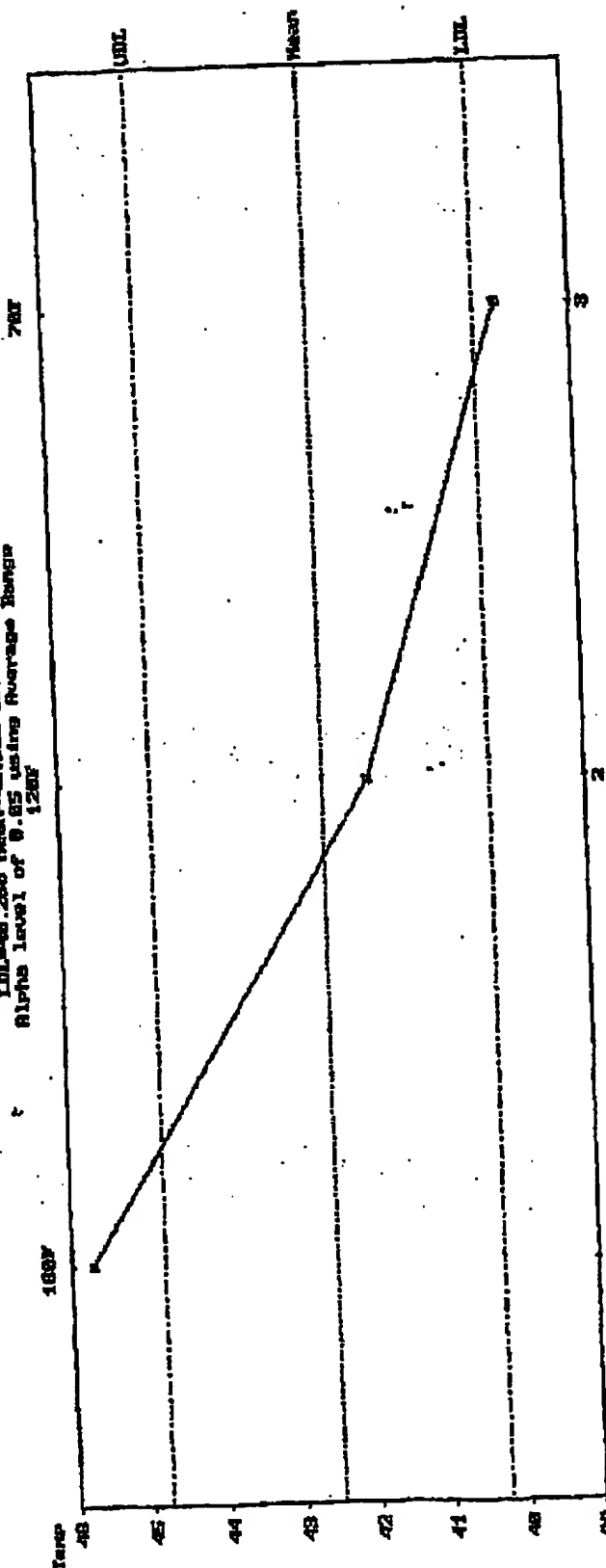
REDACTED

BISSELL R & D

VARNUM

2008

One Way ANOVA for 2 Clean  
Est. 801X-Bar=0.828 N=2.816 for 3 subgroups with 0.4 df  
LML=0.259 Mean=2.522 UML=4.783  
Alpha level of 0.05 using Average Range



Design: 3 run fully crossed

Run  
Problem file: bleach1  
Study name: Temp effect, Bleach

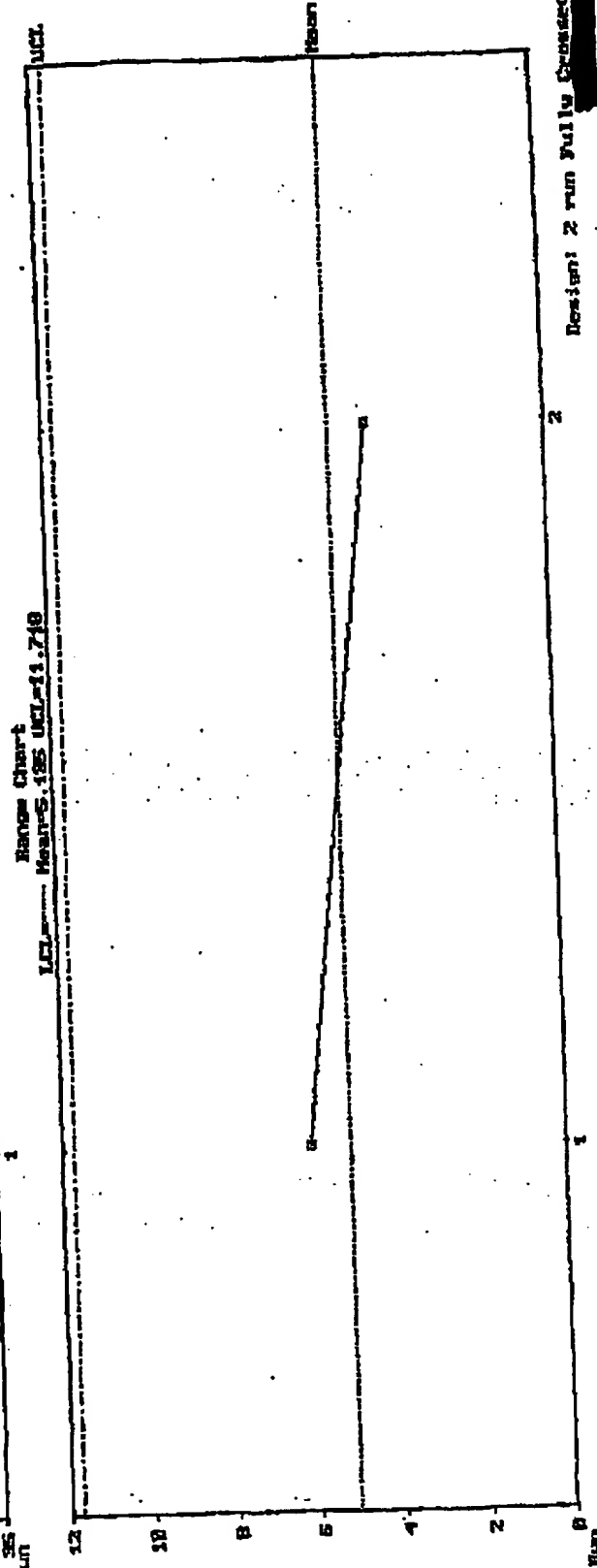
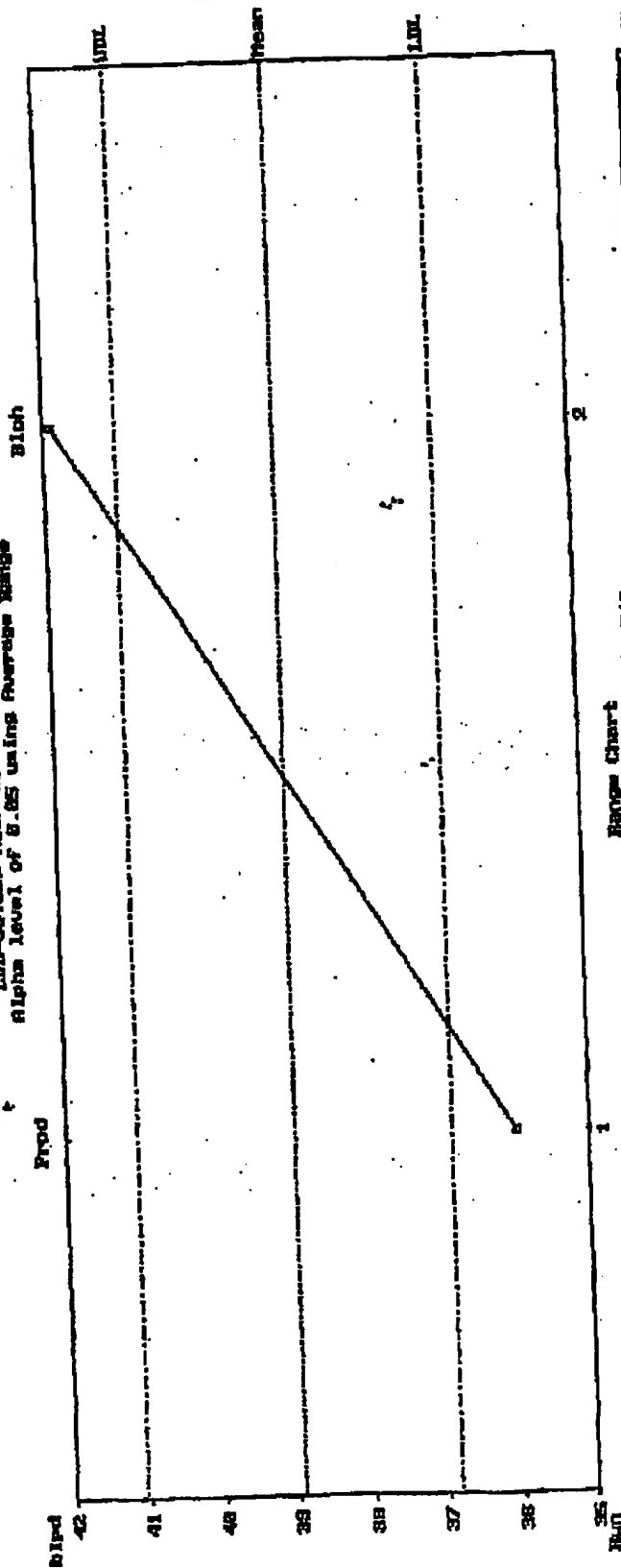
REDACTED

BISSELL R & D

VARNUM

010

One Run RND for 2 Clean  
Est. SD(X-Bar)=1.185 (n=1.757 for 2 subgroups with 5.7 df  
LCL=38.688 Mean=38.949 UCL=41.848  
Alpha level of 0.05 using Average Range



Design: 2 run Fully Crossed

Run  
Problem file: bleachB  
Study name: 1209, Bleach vs Prod

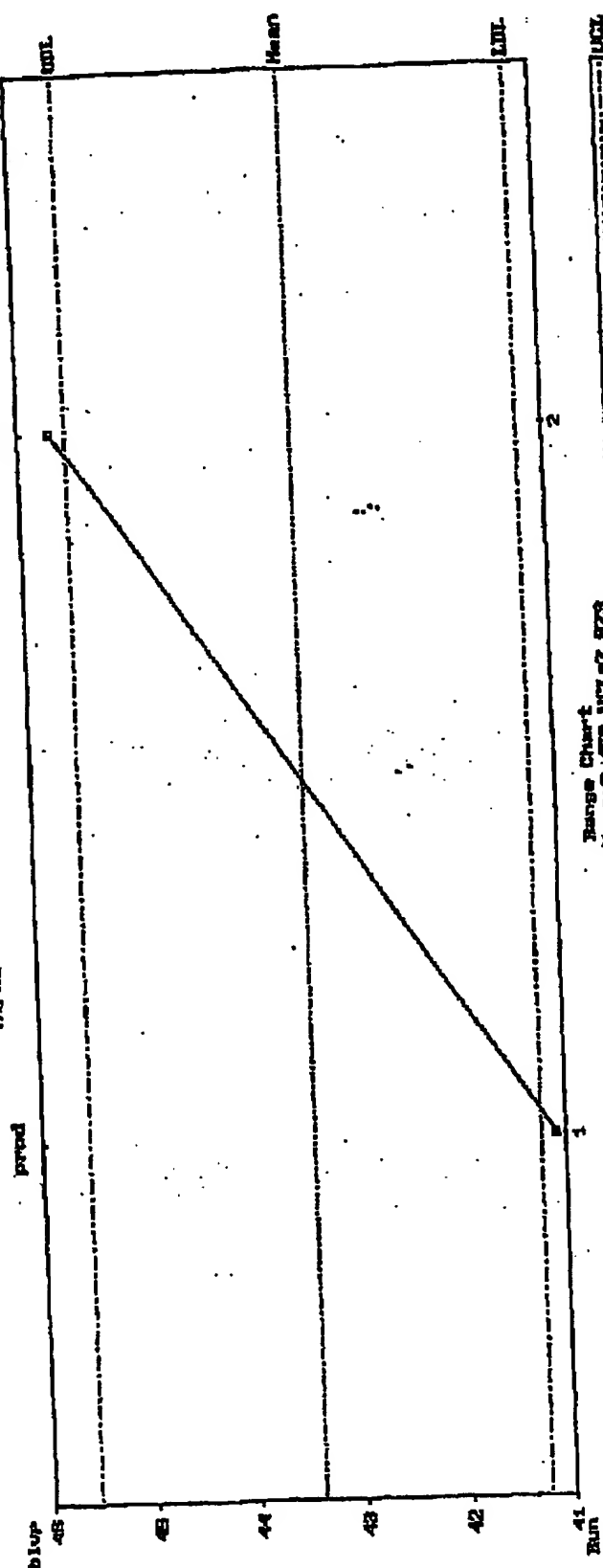
REDACTED

BISSELL R & D

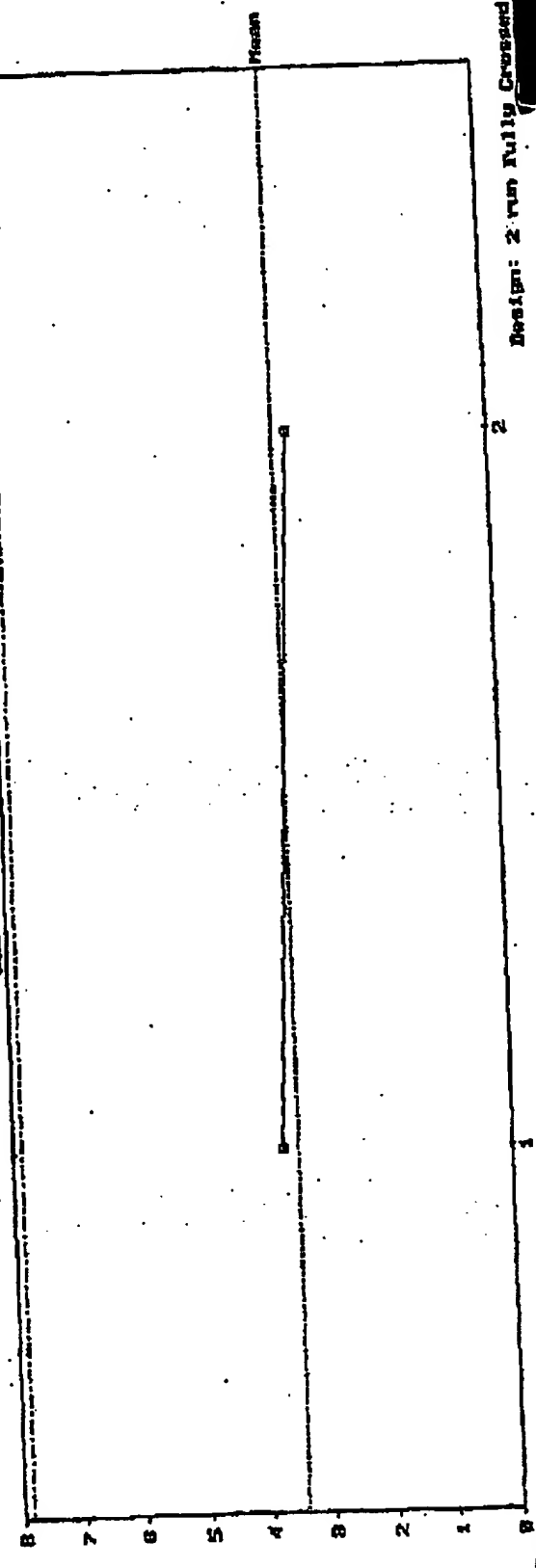
VARNUM

011

One Day Run for 3 Clean  
Est.  $\sigma_{KX-Bar} = 0.803$   $\bar{X} = 2.688$  for 2 subgroups with 5.7 df  
LCL = 41.238 Mean = 43.388 UCL = 45.555  
Alpha level of 0.01 using Average Range



Range Chart  
Y-axis: Run  
X-axis: Run



Design: 2 run Fully Crossed

Run  
Problem file: blasch2  
Study runs: 1557, Blasch vs pred

REDACTED

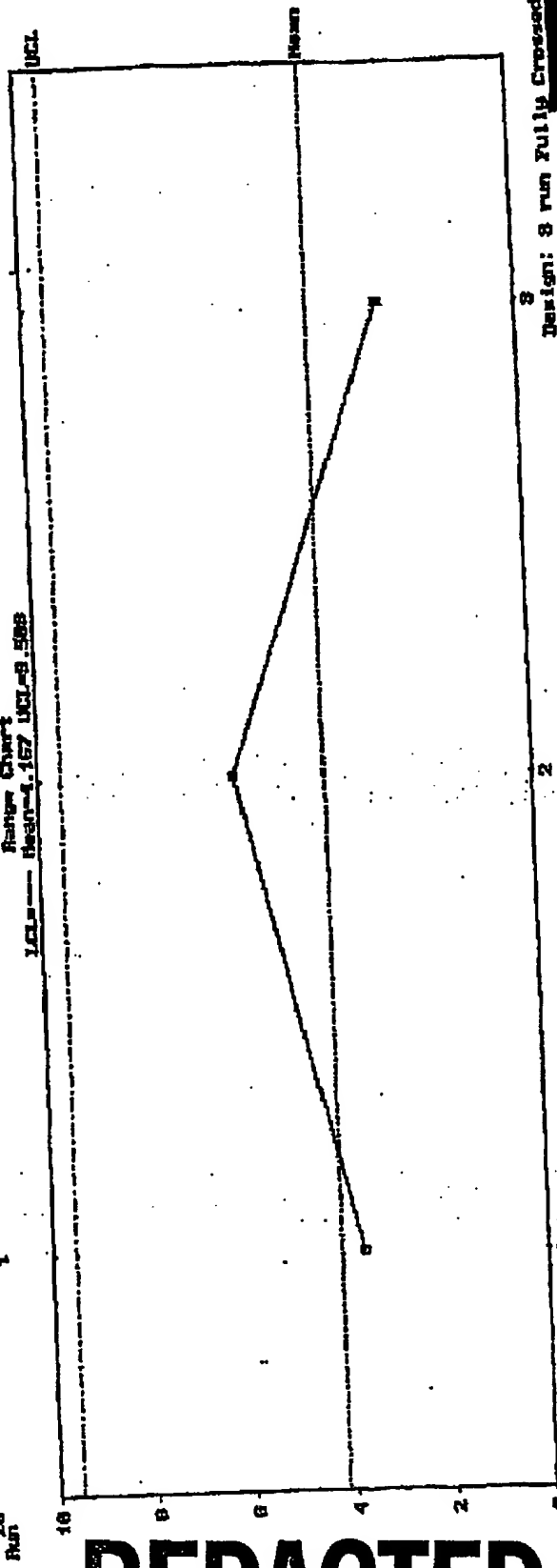
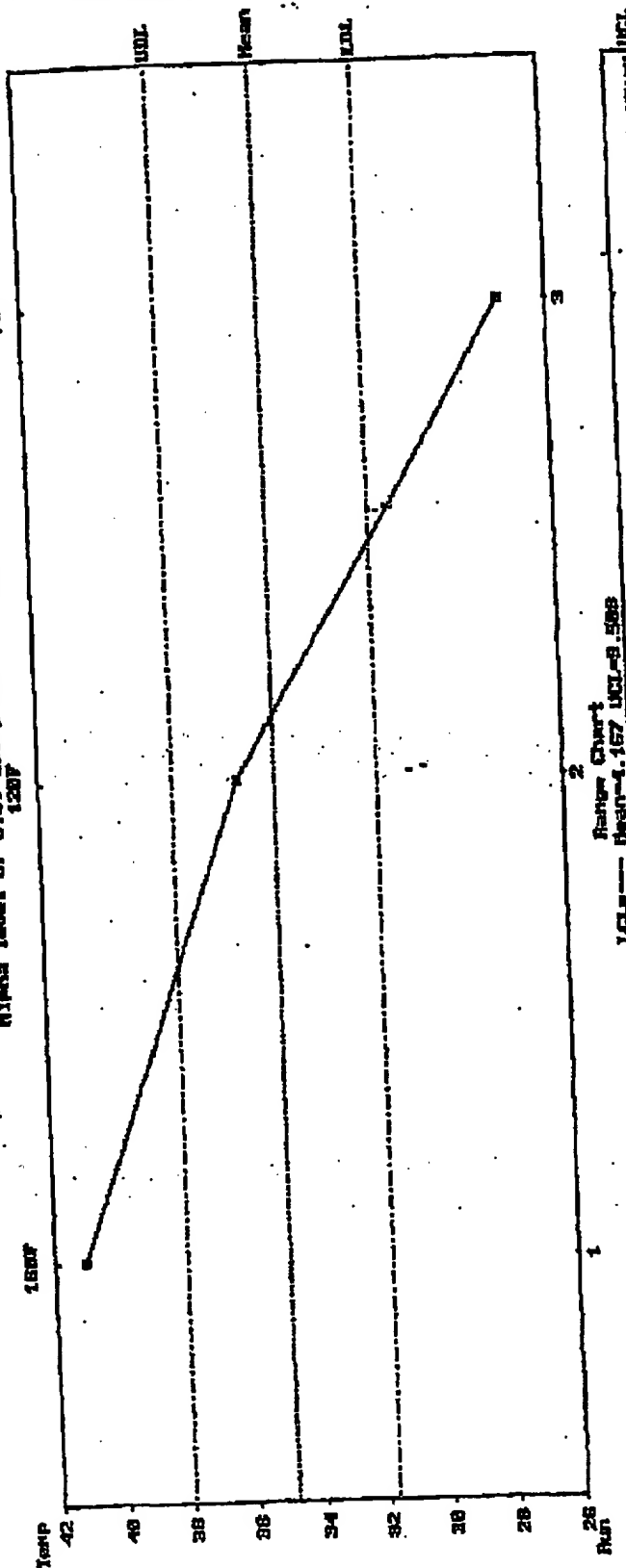
BISSELL R & D

VARNUM

012

One Run from for 2 Clean  
Est.  $\sigma(X-Bar) = 0.889$   $n = 3$  Subgroups with 0.4 of  
LCL = 31.718 Mean = 34.857 UCL = 38.003  
Alpha level of 0.01 using Average Range

70P



Design: 3 run Fully Crossed

Run  
Problem file: blaschia  
Study name: Temp effect, Product

REDACTED